CLAIMS:

1. A method of manufacturing a packaged semiconductor device comprising subjecting a metal carrier (100) provided with at least one semiconductor crystal, the semiconductor crystals being provided with an encapsulation, to a singulation step in a dicing apparatus that is provided with a dicing blade (5) comprising diamond grains, in which singulation step the dicing blade (5) cuts, while being cooled with a cooling fluid, through the encapsulation and the metal carrier (100) so as to singulate the at least one semiconductor device, characterized in that a friction force reducing cooling fluid is applied during the singulation step by means of the dicing blade (5).

2. A method as claimed in claim 1, characterized by the use of synthetic oil as an additive to cooling water as the friction force reducing cooling fluid in the form of an emulsion of the oil in water.

3. A method as claimed in claim 2, characterized by applying the synthetic oil in a volume percentage in the range from 1 to 10.

4. A method as claimed in claim 1, 2 or 3, characterized by the use of a dicing blade (5) of sintered metal with sharp cleaving diamond grains, the sharp cleaving diamond grains being applied in the dicing blade in a concentration smaller than or equal to a maximum concentration, which maximum concentration is defined by the concentration at which the mutual distance between the diamond grains that contribute to the cutting is just large enough to allow removal of substantially all sawing debris.

5. A method as claimed in claim 4, characterized by applying the sharp cleaving diamond grains in the dicing blade (5) in a concentration larger than or equal to a minimum concentration, which minimum concentration is defined by the concentration at which the dicing force per diamond grain that contributes to the cutting is just low enough to prevent the diamond grain from breaking out of the dicing blade.

6. A method as claimed in claim 4 or 5, characterized by applying the sharp cleaving diamond grains with a size in the range from 20 to 60 micrometers.

7. A method as claimed in any one of the preceding claims, characterized by applying the metal carrier (100) with a design that is symmetrical along sawing lanes (4) along which the dicing blade (5) cuts the carrier (100).

8. A method as claimed in claim 7, characterized by providing side parts (C) of the carrier (100) with slots (7) that are positioned in front of the sawing lanes (4).

9. A method as claimed in any one of the preceding claims, characterized by providing the metal carrier (100) with a reduced thickness at various locations (4,8,9A,9B,9C).

10. A method as claimed in claim 9, characterized by reducing the thickness of the metal carrier (100) from the bottom side of the carrier (100) by means of etching.

11. A method as claimed in any one of the preceding claims, characterized by applying a ductile metal carrier (100) like a copper carrier.

12. A method as claimed in any one of the preceding claims, characterized by applying a, preferably glass filled, epoxy encapsulation.

13. Packaged semiconductor device obtained with a method according to any one of the preceding claims.

14. Metal carrier (100) suitable for use in method according to any one of the claims 1 to 12, characterized by a symmetrical design along sawing lanes (4) where the carrier (100) is to be cut.

15. Metal carrier (100) as claimed in claim 14, characterized by the provision of slots (7) positioned in front of the sawing lanes (4).

16. Metal carrier as claimed in claim 14 or 15, characterized by the provision of areas (4,8,9A,9B,9C) with a reduced thickness.

17. A dicing apparatus for subjecting a metal carrier (100) provided with at least one semiconductor crystal that is provided with an encapsulation to a singulation step, in which singulation step a dicing blade (5) cuts, while being cooled with a cooling fluid, through the encapsulation and the metal carrier (100) so as to singulate the at least one semiconductor device, the dicing apparatus being characterized by the presence of means (6) for supplying a friction force reducing cooling fluid during the singulation step.

18. A dicing apparatus as claimed in claim 17, characterized by a dicing blade (5) of sintered metal with sharp cleaving diamond grains, the sharp cleaving diamond grains being applied in the dicing blade in a concentration smaller than or equal to a maximum concentration, which maximum concentration is defined by the concentration at which the mutual distance between the diamond grains that contribute to the cutting is just large enough to allow removal of substantially all sawing debris.